

## I Claim .

1. A device for promoting oral hygiene and treating gingivitis, other periodontal problems and oral mal odor treatment device that comprises an electrical output apparatus and a pair of disposable electrical conductive, flexible pad elements for electrical connection to said electrical output apparatus and suitably designed for insertion into the oral cavity of a patient, said pair of flexible pad elements containing an electrical conductive amount of an electrical conductive material such that the electrical resistance of the electrical conductive flexible pad elements is  $1\text{ k}\Omega$  or less and whereby electrical current wave forms similar to the biological electrical currents that occur in the human body are adapted to provide an electrical effect to the gums of the patient by contacting the gums with the flexible pad elements that conduct electricity from the electrical output apparatus through the flexible pad elements to the gums of the patient, wherein said electrical output apparatus is adapted to repeatedly output an electrical voltage within the range of from about  $\pm 0.3\text{V}$  to about  $\pm 3.9\text{V}$  to said flexible elements as a combination of ultra-weak electrical currents that are comprised of a combination of multiple types of current wave forms made up of alternating current square-waves of differing patterns, such that when said flexible elements come into contact with the gums of the patient, said flexible elements pass through and apply to the gums a low electrical current of  $500\mu\text{A}$  or less in order to promote oral hygiene and provide treatment of the patient for the effects of gingivitis, other periodontal problems and oral mal odor.
2. A device according to claim 1, wherein  
the said alternating current wave forms are provided with a 1st reference electric potential as a mid-point of an electric potential level on a positive side and the electric potential level on a negative side,  
repetitive alternating current wave form combinations are provided by repetitively combining the said alternating current wave forms provided as a single pattern in an alternating current square-wave pattern in a manner such

that one level of the two electric potentials is provided and then, in turn, another electric potential is provided for the time of a 1st reference time, and a triple consecutive pattern in which the said single pattern is continued three times, and a pause for twice the time of the said 1st reference time

in the sequence of the said triple consecutive pattern, the said pause, the said triple consecutive pattern, the said pause, the said single pattern, the said pause, the said single pattern, the said pause, the said single pattern, the said pause and the said single pattern, the said pause.

3. A device according to claim 1, wherein the said alternating current wave forms are provided with a reference electrical potential as a mid-point of the electrical potential level on the positive side and the electric potential level of the negative side,

a repeated alternating current wave form combination is provided by a 1st repetitive alternating current wave form pattern providing one level of the two electric potential levels for the time of a 2nd reference time and providing the other level of the electric potential levels for 1/2 the time of the said 2nd reference time, and

a 2nd repetitive alternating current wave form pattern providing the said one level of electric potential levels for 1/2 of the time of the said 2nd reference time, providing the aforementioned reference electric potential for 1/2 of the time of the said 2nd reference time and providing the said other level of electric potential for 1/2 of the time of the said reference time, and

a pause providing the said electrical potential for 1/2 of the time of the said 2nd reference time

in the sequence of the said 1st repetitive pattern, the said pause, the said 1st repetitive pattern, the said pause, the said 2nd repetitive pattern, the said pause, the said 2nd repetitive pattern and said pause.

4. A device according to claim 1, wherein

the said alternating current wave forms are provided with a 1st reference electric potential as a mid-point of the electric potential level on the positive side and the electric potential level on the negative side,

the repeated alternating current wave form combination are provided by a 3rd repetitive alternating current wave form pattern providing one of two electrical potential levels for the time of a 3rd reference time and providing the aforementioned other level of the electric potential levels for the time of the said 3rd reference time and providing the other level of the electric potential levels for the time of the said 3rd reference time and providing the said reference electric potential for twice the time of the said 3rd reference time and providing the said other level of the electric potential levels for  $1/4$  of the time of the said 3rd reference time and providing the said reference electric potential for  $1/2$  of the time of the said 3rd reference time and providing the said other level of electric potential levels for  $1/4$  of the time of the said 3rd reference time and providing the said reference electric potential for the time of the said 3rd reference time and providing the said other level of the electric potential levels for  $1/4$  of the time of the said 3rd reference time and providing the reference electric potential for  $1/2$  of the time of the 3rd reference time and providing the said other level of the electric potential levels for  $1/4$  of the time of the 3rd reference time and providing the said reference electric potential for the time of the said reference time, and

a repetitive pattern in one direction providing the said reference electric potential for the time of the said 3rd reference time and providing the said one electric potential level for the  $1/4$  of time of the said 3rd reference time and providing the said reference electric potential for the  $1/2$  of time of the said 3rd reference time and providing the said one level of the electric potential levels for the  $1/4$  time of the said 3rd reference time, and

a repetitive pattern in the other direction providing the said reference electric potential for the time of the said 3rd reference time and providing the said other level of the electric potential levels for the  $1/4$  of the time of the said 3rd reference time and providing the said reference electric potential for the  $1/2$  of

the time of the said 3rd reference time and providing the said other level of the electric potential levels for the 1/4 of the time of the said 3rd reference time, and

a pause providing the said electrical potential for the time of the said 3rd reference time

in the sequence of the said 3rd repetitive pattern, the said 3rd repetitive pattern, the said repetitive pattern in one direction, the said repetitive pattern in the other direction, the said pause, the said repetitive pattern in one direction, the said repetitive pattern in the other direction, the said pause, and the said repetitive pattern in one direction.

5. A device according to claim 1, wherein the alternating current wave form is such that it is characterized by the alternating current wave form described in Claim 2 is provided, then the alternating current wave form described in Claim 3 is provided, and then the alternating current wave form described in Claim 4 is provided, with the said 2nd reference time established as quadruple the time of the said 1st reference time and the said 3rd reference time established to be equal to the time of the said 1st reference time.
6. A device according to claim 5, wherein the said 1st reference time is 0.4 second.
7. A device according to claim 1, wherein the device  
is a device wherein the electrical output apparatus has an alternating output portion and a direct current output portion connected thereto and for connection to the pair of electrical conductive flexible pad elements as a pair of electrical conductors, and  
the device provides a discharge electrical current that becomes electrical stimulation to gums of a patient when the pair of the said flexible pad elements come into contact with gums of the patient.
8. A device according to claim 2, wherein the device

is a device wherein the electrical output apparatus has an alternating output portion and a direct current output portion connected thereto and for connection to the pair of electrical conductive flexible pad elements as a pair of electrical conductors, and

the device provides a discharge electrical current that becomes electrical stimulation to gums of a patient when the pair of the said flexible pad elements come into contact with gums of the patient.

9. A device as claimed in Claim 1, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into contact with gums of a patient.
10. A device as claimed in Claim 2, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into contact with gums of a patient.
11. A device as claimed in Claim 3, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into contact with gums of a patient.
12. A device as claimed in Claim 4, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into

contact with gums of a patient.

13. A device as claimed in Claim 5, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into contact with gums of a patient.
14. A device as claimed in Claim 6, wherein said device additionally comprises electrical conductors having terminals that are electrically conductive, to which the electrically conductive flexible pad elements can be attached and detached at will, are held to discharge direct electrical current when the said come into contact with gums of a patient.
15. A device as claimed in Claim 9, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.
16. A device as claimed in Claim 10, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.
17. A device as claimed in Claim 11, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.
18. A device as claimed in Claim 12, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.

19. A device as claimed in Claim 13, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.
20. A device as claimed in Claim 14, wherein each flexible pad element of the pair of flexible pad elements has a terminal that is electrical conductive and which is attachable and detachable at will to a terminal of the electrical conductors.
21. A device as claimed in claim 1, wherein the electrical control device is adapted to repeatedly output the electrical voltage within the range of from about  $\pm 0.3V$  to about  $\pm 3.9V$  in a cycle time of about 12.8 seconds.
22. A device as claimed in claim 1, wherein the electrical control device additionally comprises at least one voltage control switch for raising or lowering the voltage output of the electrical control device.
23. A method for promoting oral hygiene, treating a patient for gingivitis, other periodontal problems and oral mal odor, the method comprising transmitting to the gums of a patient electrical current wave forms of electrical voltage within the range of from about  $\pm 0.3V$  to about  $\pm 3.9V$  as a combination of ultra-weak electrical currents that are comprised of a combination of multiple types of current wave forms made up of alternating current square-waves of differing patterns, such that there is applied to the gums a low electrical current of  $500\mu A$  or less in order to provide treatment of the patient for promoting oral hygiene and combating the effects of gingivitis, other periodontal problems and oral mal odor.
24. A method of treatment according to claim 23, wherein  
the said alternating current wave forms are provided with a 1st reference electric potential as a mid-point of an electric potential level on a positive side and the electric potential level on a negative side,

repetitive alternating current wave form combinations are provided by repetitively combining the said alternating current wave forms provided as a single pattern in an alternating current square-wave pattern in a manner such that one level of the two electric potentials is provided and then, in turn, another electric potential is provided for the time of a 1st reference time, and a triple consecutive pattern in which the said single pattern is continued three times, and a pause for twice the time of the said 1st reference time

in the sequence of the said triple consecutive pattern, the said pause, the said triple consecutive pattern, the said pause, the said single pattern, the said pause, the said single pattern, the said pause, the said single pattern, the said pause and the said single pattern, the said pause.

25. A method of treatment according to claim 23, wherein the said alternating current wave forms are provided with a reference electrical potential as a mid-point of the electrical potential level on the positive side and the electric potential level of the negative side,

a repeated alternating current wave form combination is provided by a 1st repetitive alternating current wave form pattern providing one level of the two electric potential levels for the time of a 2nd reference time and providing the other level of the electric potential levels for 1/2 the time of the said 2nd reference time, and

a 2nd repetitive alternating current wave form pattern providing the said one level of electric potential levels for 1/2 of the time of the said 2nd reference time, providing the aforementioned reference electric potential for 1/2 of the time of the said 2nd reference time and providing the said other level of electric potential for 1/2 of the time of the said reference time, and

a pause providing the said electrical potential for 1/2 of the time of the said 2nd reference time

in the sequence of the said 1st repetitive pattern, the said pause, the said 1st repetitive pattern, the said pause, the said 2nd repetitive pattern, the said



pause, the said 2nd repetitive pattern and said pause.

26. A method of treatment according to claim 23, wherein the said alternating current wave forms are provided with a 1st reference electric potential as a mid-point of the electric potential level on the positive side and the electric potential level on the negative side,

the repeated alternating current wave form combination are provided by a 3rd repetitive alternating current wave form pattern providing one of two electrical potential levels for the time of a 3rd reference time and providing the aforementioned other level of the electric potential levels for the time of the said 3rd reference time and providing the other level of the electric potential levels for the time of the said 3rd reference time and providing the said reference electric potential for twice the time of the said 3rd reference time and providing the said other level of the electric potential levels for 1/4 of the time of the said 3rd reference time and providing the said reference electric potential for 1/2 of the time of the said 3rd reference time and providing the said other level of electric potential levels for 1/4 of the time of the said 3rd reference time and providing the said reference electric potential for the time of the said 3rd reference time and providing the said other level of the electric potential levels for 1/4 of the time of the said 3rd reference time and providing the reference electric potential for 1/2 of the time of the 3rd reference time and providing the said other level of the electric potential levels for 1/4 of the time of the 3rd reference time and providing the said reference electric potential for the time of the said reference time, and

a repetitive pattern in one direction providing the said reference electric potential for the time of the said 3rd reference time and providing the said one electric potential level for the 1/4 of time of the said 3rd reference time and providing the said reference electric potential for the 1/2 of time of the said 3rd reference time and providing the said one level of the electric potential levels for the 1/4 time of the said 3rd reference time, and

a repetitive pattern in the other direction providing the said reference

electric potential for the time of the said 3rd reference time and providing the said other level of the electric potential levels for the 1/4 of the time of the said 3rd reference time and providing the said reference electric potential for the 1/2 of the time of the said 3rd reference time and providing the said other level of the electric potential levels for the 1/4 of the time of the said 3rd reference time, and

a pause providing the said electrical potential for the time of the said 3rd reference time

in the sequence of the said 3rd repetitive pattern, the said 3rd repetitive pattern, the said repetitive pattern in one direction, the said repetitive pattern in the other direction, the said pause, the said repetitive pattern in one direction, the said repetitive pattern in the other direction, the said pause, and the said repetitive pattern in one direction.

27. A method of treatment according to claim 23, wherein the alternating current wave form is such that it is characterized by the alternating current wave form described in Claim 24 is provided, then the alternating current wave form described in Claim 25 is provided, and then the alternating current wave form described in Claim 26 is provided, with the said 2nd reference time established as quadruple the time of the said 1st reference time and the said 3rd reference time established to be equal to the time of the said 1st reference time.
28. A method of treatment according to claim 27, wherein the said 1st reference time is 0.4 second.
29. A method of treatment according to claim 23 wherein the electrical current wave forms transmitted to the gums of the patient are transmitted thereto from a device comprising an electrical output apparatus providing the electrical current wave forms of electrical voltage within the range of from about  $\pm 0.3V$  to about  $\pm 3.9V$  as a combination of ultra-weak electrical currents that are comprised of a combination of multiple types of current wave forms made up of alternating

current square-waves of differing patterns, such that there is applied to the gums a low electrical current of  $500\mu\text{A}$  or less through a pair of disposable electrical conductive, flexible pad elements electrically connected to said electrical output apparatus and inserted into the oral cavity of the patient, said pair of flexible pad elements containing an electrical conductive amount of an electrical conductive material such that the electrical resistance of the electrical conductive flexible pad elements is  $1\text{ k}\Omega$  or less.

30. A method of treatment according to claim 29 wherein the electrical current wave forms transmitted to the gums of the patient are electrical current wave forms of electrical voltage within the range of from about  $\pm 0.3\text{V}$  to about  $\pm 1.3\text{V}$ .